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Better Information at Lower Cost: IT Consolidation

Nebraska Digital Government Summit

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GM, Partner Technology Center
Oracle Government, Healthcare & Education

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Questions:

- How can we reduce costs?
- How can we make our systems more available?
- How can we make our data more secure?
- How can we make better use of our data
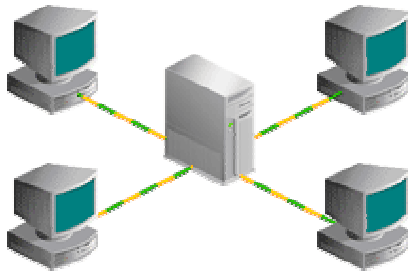- How can we establish a more flexible environment?

Answers:

- Consolidate and Integrate your infrastructure
- Standardized on commodity hardware and Linux
- Outsourcing hardware/software management
- Leverage a Grid

Building Blocks:
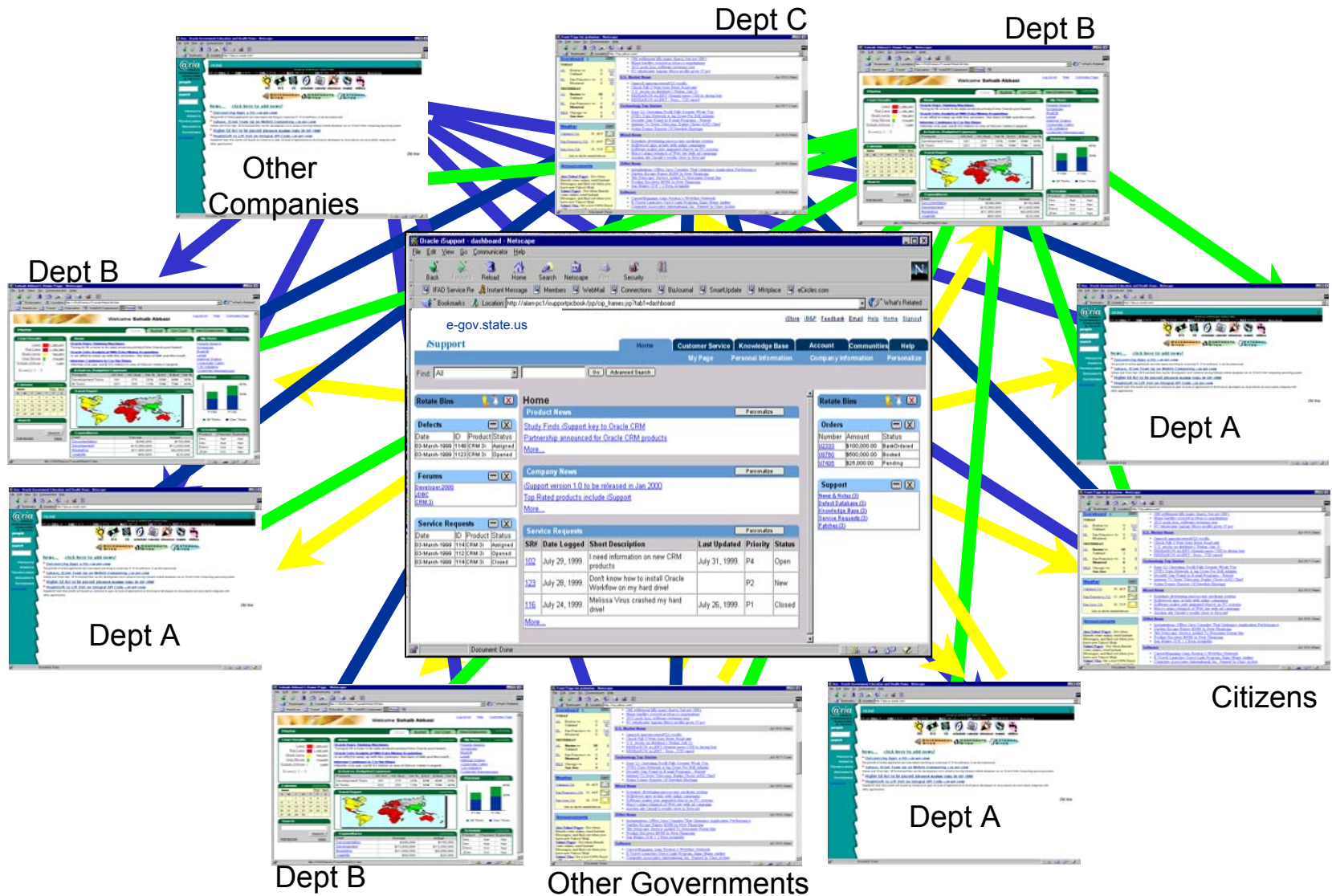
Consolidate and Integrate Your Infrastructure

Consolidate and Integrate

- Dramatically reduces costs
  - Oracle Corp saw $250m savings consolidating 50 DC
- Provide higher system availability
  - Fewer professionally managed servers
- Provide a more secure platform
  - Policy and data managed centrally
- Provide better data
  - Daily business intelligence, books close in days versus weeks
- Provide more flexibility
  - New interfaces (wireless, Voice) and processes (workflows, reports) added centrally
  - US DOT brings TSA finance system on-line in 6 weeks

How Architecture Happens

Dept C

Dept B

Other Companies

Dept B

Dept A

Dept A

Citizens

Dept B

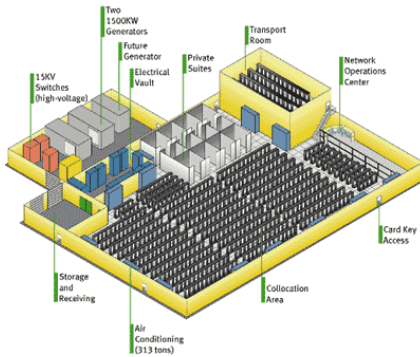Other Governments

Dept A

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What is information architecture?

- Consolidation and Architecture means different things to different people and is often relative to your role
- Discrete <u>funding</u>, has dictated discrete or vertical architectures, but enterprise architectures require horizontal integration
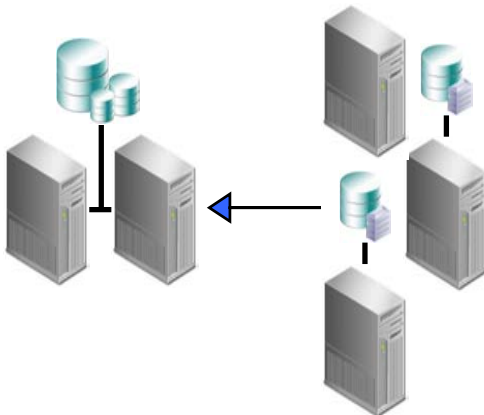
| If you are a…	Then you probably think architecture is…
Database Administrator	Data Design
Analyst	Data Flow Diagram
Network Administrator	Network Architecture
Planner	Functional Flow Diagram

What does consolidation/Integration mean?

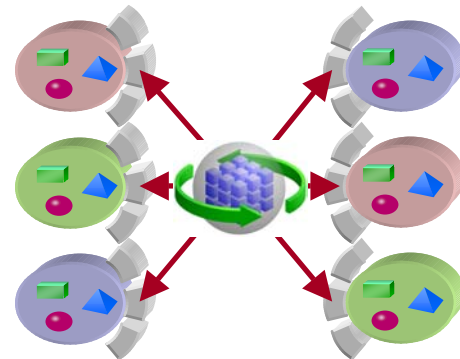**1.** Consolidate departmental servers into a professionally managed environment
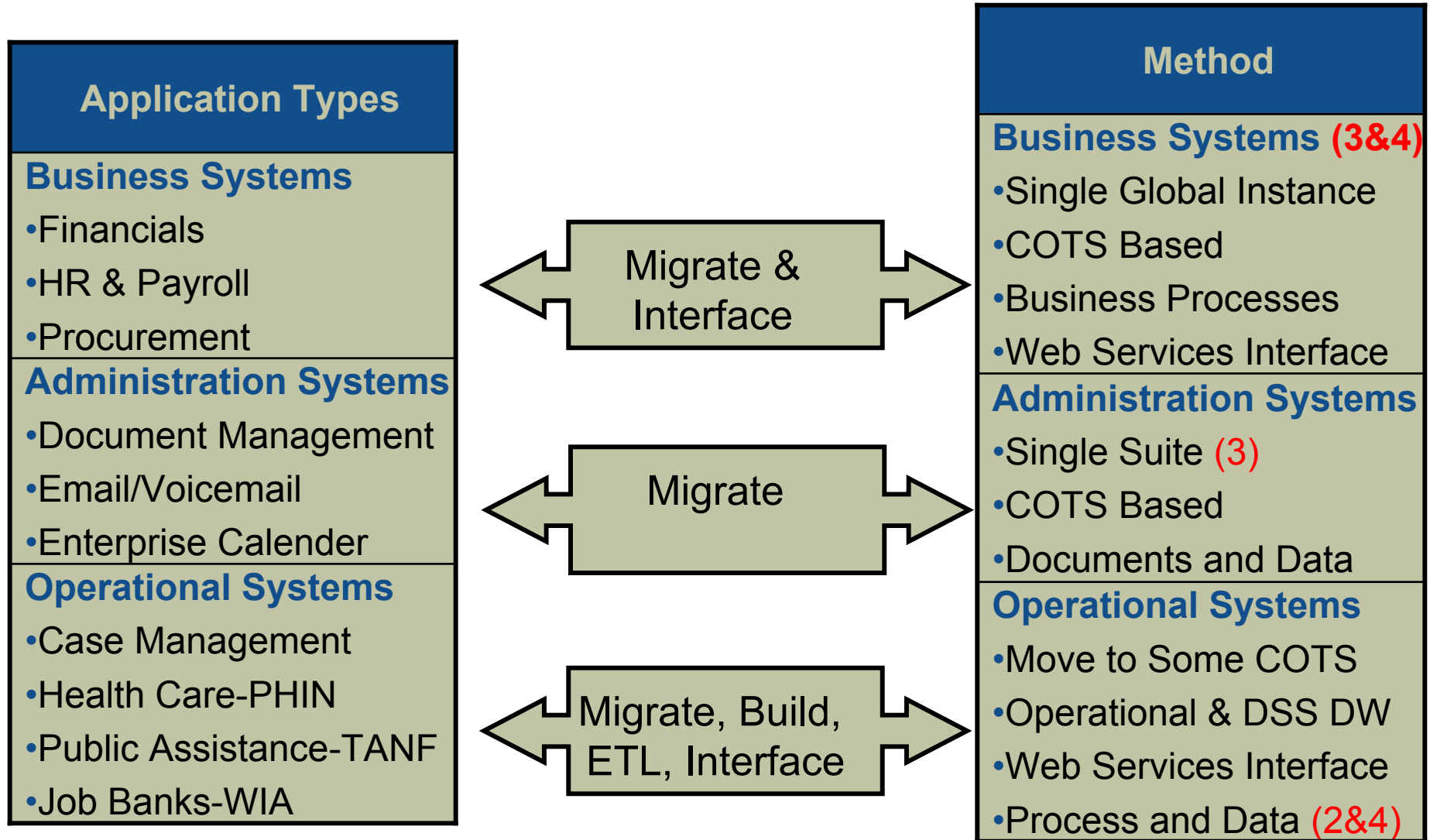

3. Consolidate multiple data models into one, common data model

2. Building data warehouses/marts
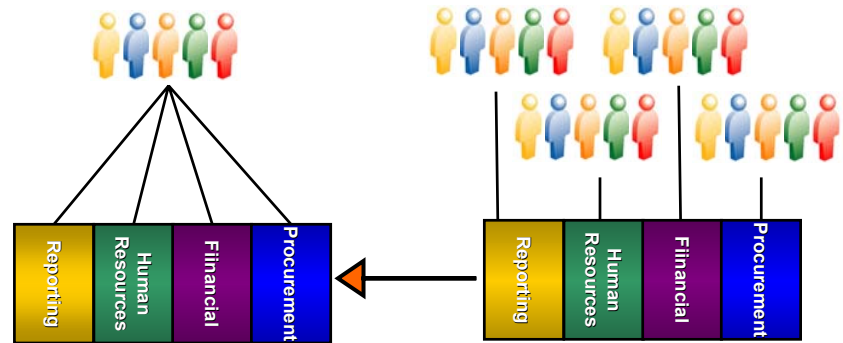
4. Consolidate multiple applications into a web service based infrastructure

Not all applications handled the same way!

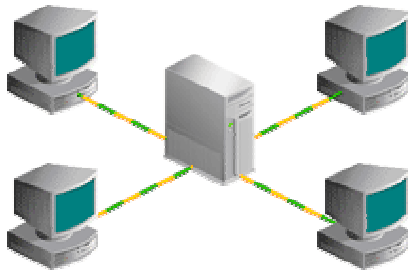| Application Types		Method
Business Systems •Financials •HR & Payroll •Procurement	**Migrate & Interface**	**Business Systems (3&4)** •Single Global Instance •COTS Based •Business Processes •Web Services Interface
Administration Systems •Document Management •Email/Voicemail •Enterprise Calender	**Migrate**	**Administration Systems** •Single Suite (3) •COTS Based •Documents and Data
Operational Systems •Case Management •Health Care-PHIN •Public Assistance-TANF •Job Banks-WIA	**Migrate, Build, ETL, Interface**	**Operational Systems** •Move to Some COTS •Operational & DSS DW •Web Services Interface •Process and Data (2&4)

Hybrid Architecture

Single, personalized enterprise
view of all authorized information

Portal

Service

CRM

Human Resources

Financials

Procurement

Third Party

Email/Files

DW

External

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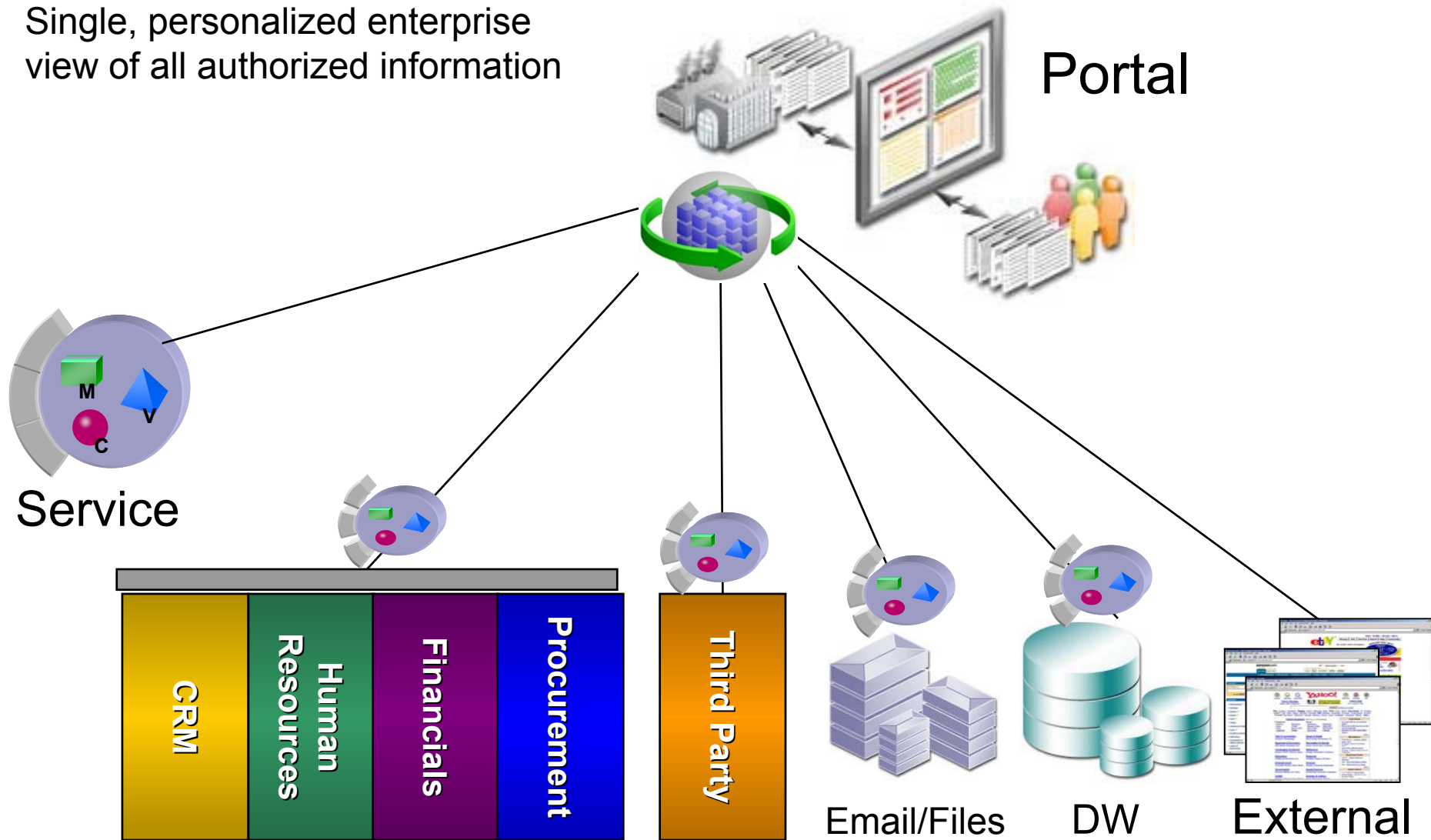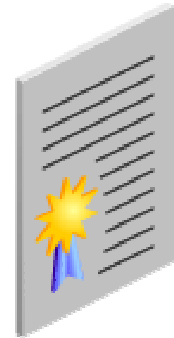
Requirement:

Establish a secure, standards based infrastructure!

Establishing a technology platform

Channel

Wireless & Mobile

Browser
•Personalized
•Private

Voice/IVR

Application

Application Server
•J2EE
•HTTP/HTTPS
•Portal
•Wireless/Voice
•Cache
•Web Services
•Integration services
•LDAP
•BI/Ad-Hoc

Database

Database Server & Storage
•Clustered (RAC)
•Secure (ISO15408)
•HIPAA
•Spatial data/XML
•Disaster Recovery
•Data Mining
•OLAP
•SAN/NAS
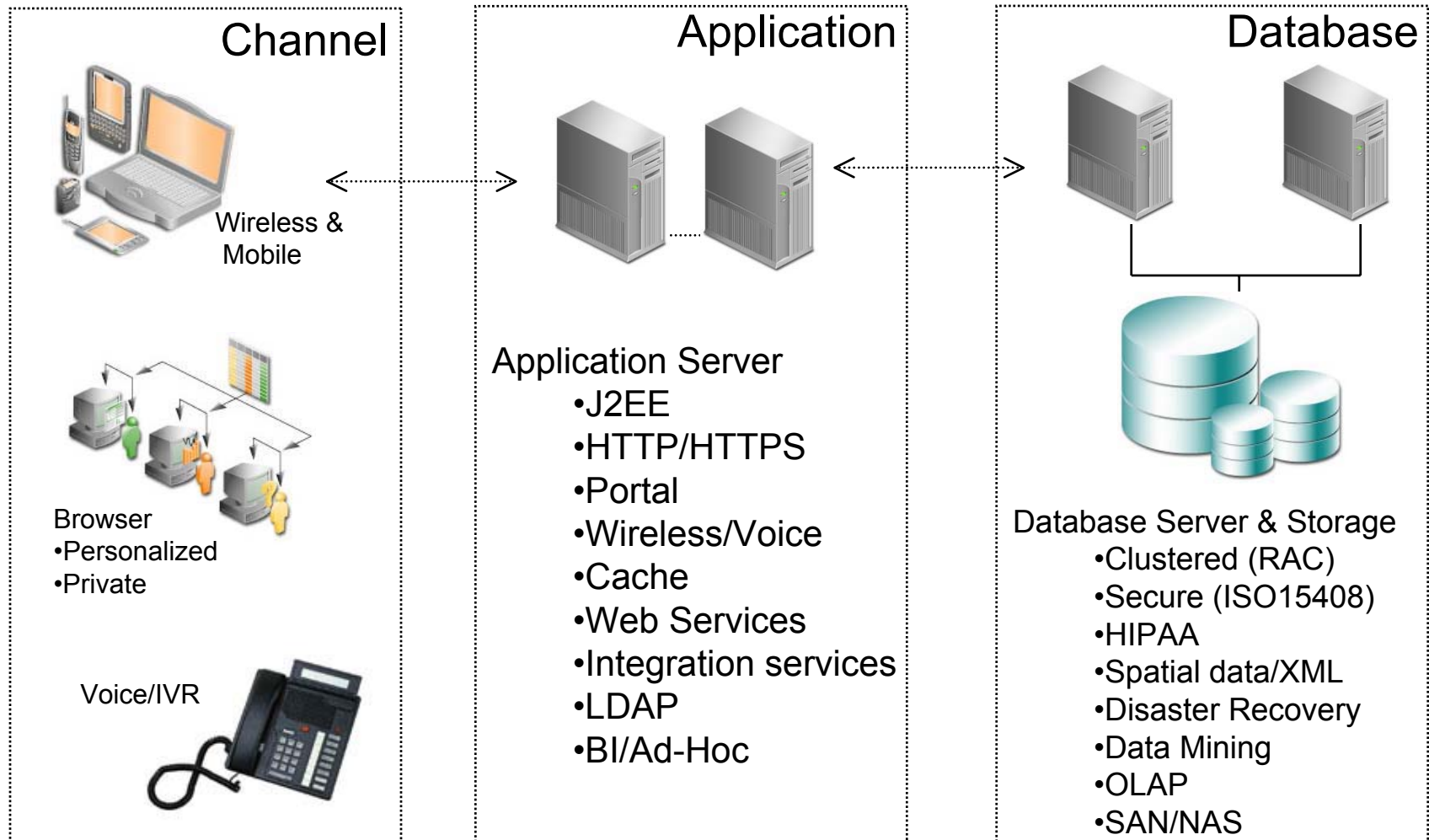
Standards Based
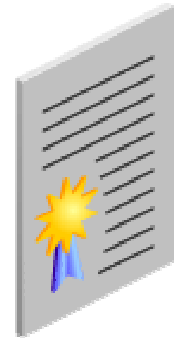
Requirement:

Information Assurance

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Information Assurance: Security

Users

External

Employer

Clerk

Manager

Network

Data

KING	Region	
SCOTT	Alert	
PIERMAR	Data	
KNOX	Location	
KYTE	Watch	
CAREY	Test Result	
HOECHST	Available	

Authenticate   **Privacy & integrity of communications**   **Access control**   **Privacy & integrity of Data**   **Comprehensive auditing**
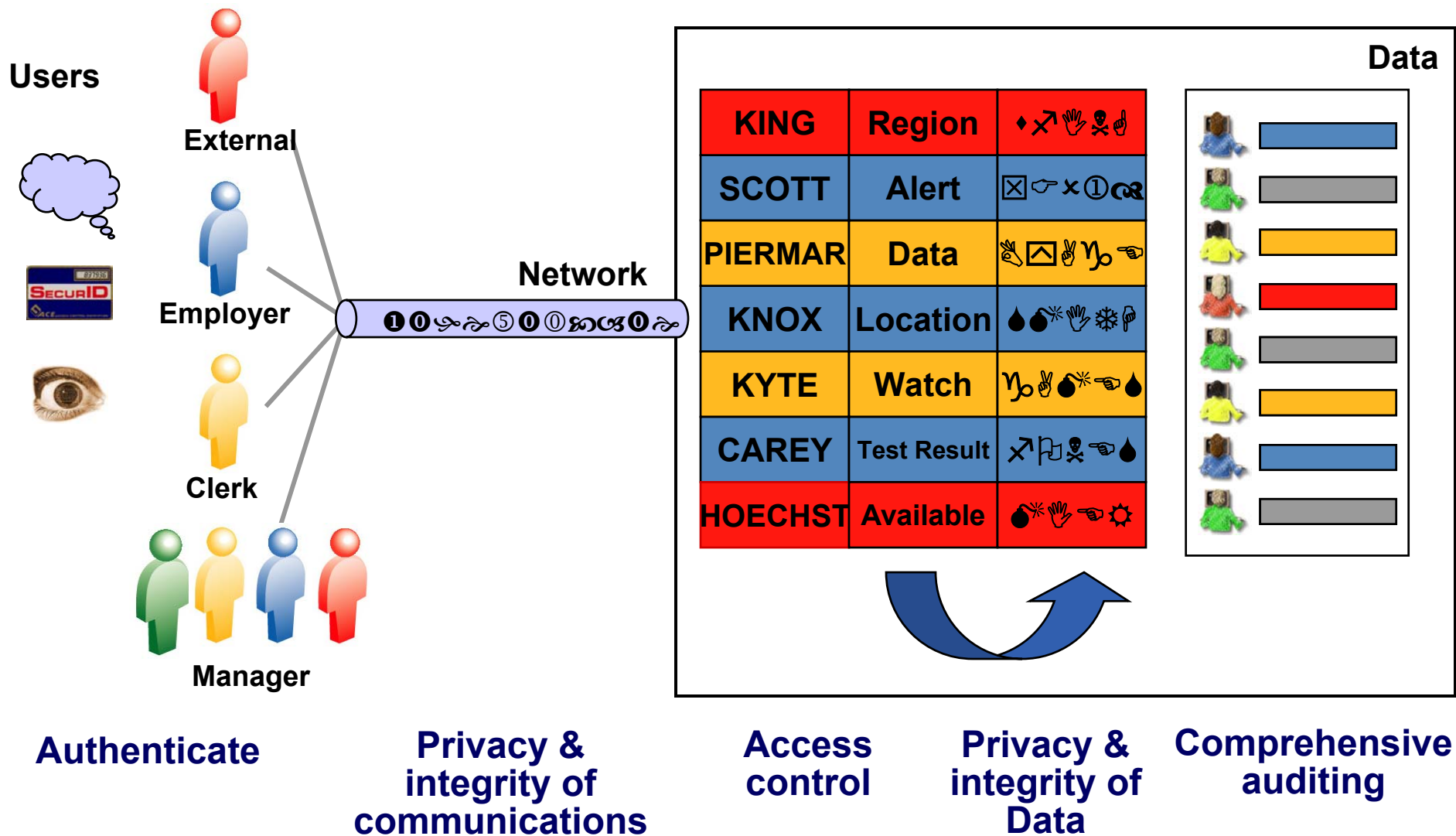
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Independent Security Evaluations

Security Criteria	Oracle
TCSEC, Level B1	1
TCSEC, Level C2	1
ITSEC, levels E3/F-C2	3
ITSEC, levels E3/F-B1	3
Common Criteria, ISO 15408	4
Russian Criteria, levels III, IV	2
FIPS 140-1, level 2	1
TOTAL	15

NSTISSP—Policy # 11

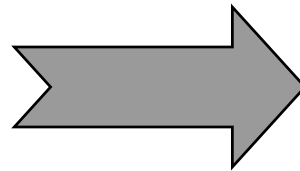# Information Assurance: High Availability
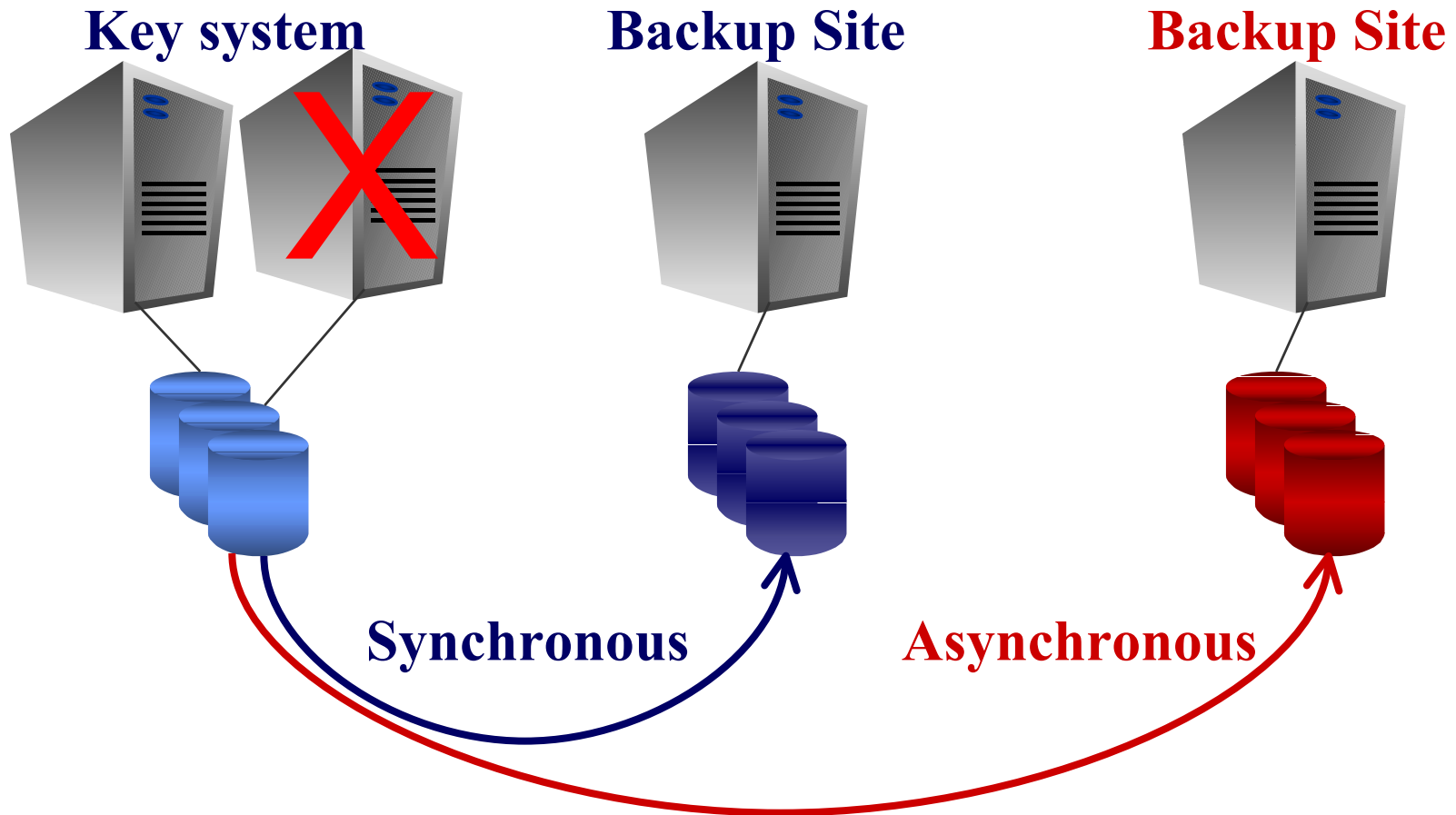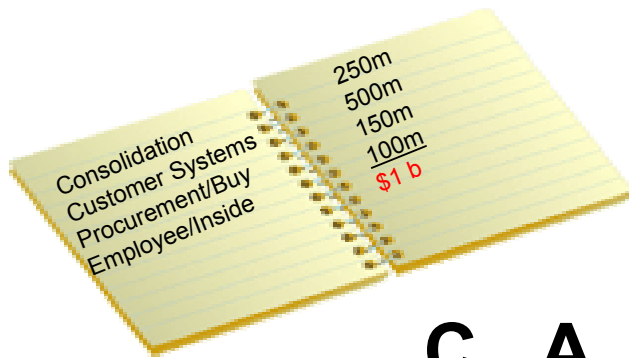
C A S E S T U D Y

Oracle Consolidation

- Consolidation
- Integration
- Shared Services
- Self Service
- e-Business Suite

→

Oracle Saves $250m by Consolidating IT! (and Billion $ as an e-Business)

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The Oracle Corporation Consolidation

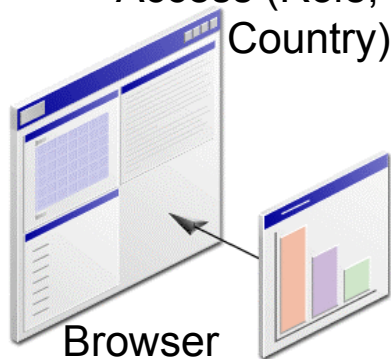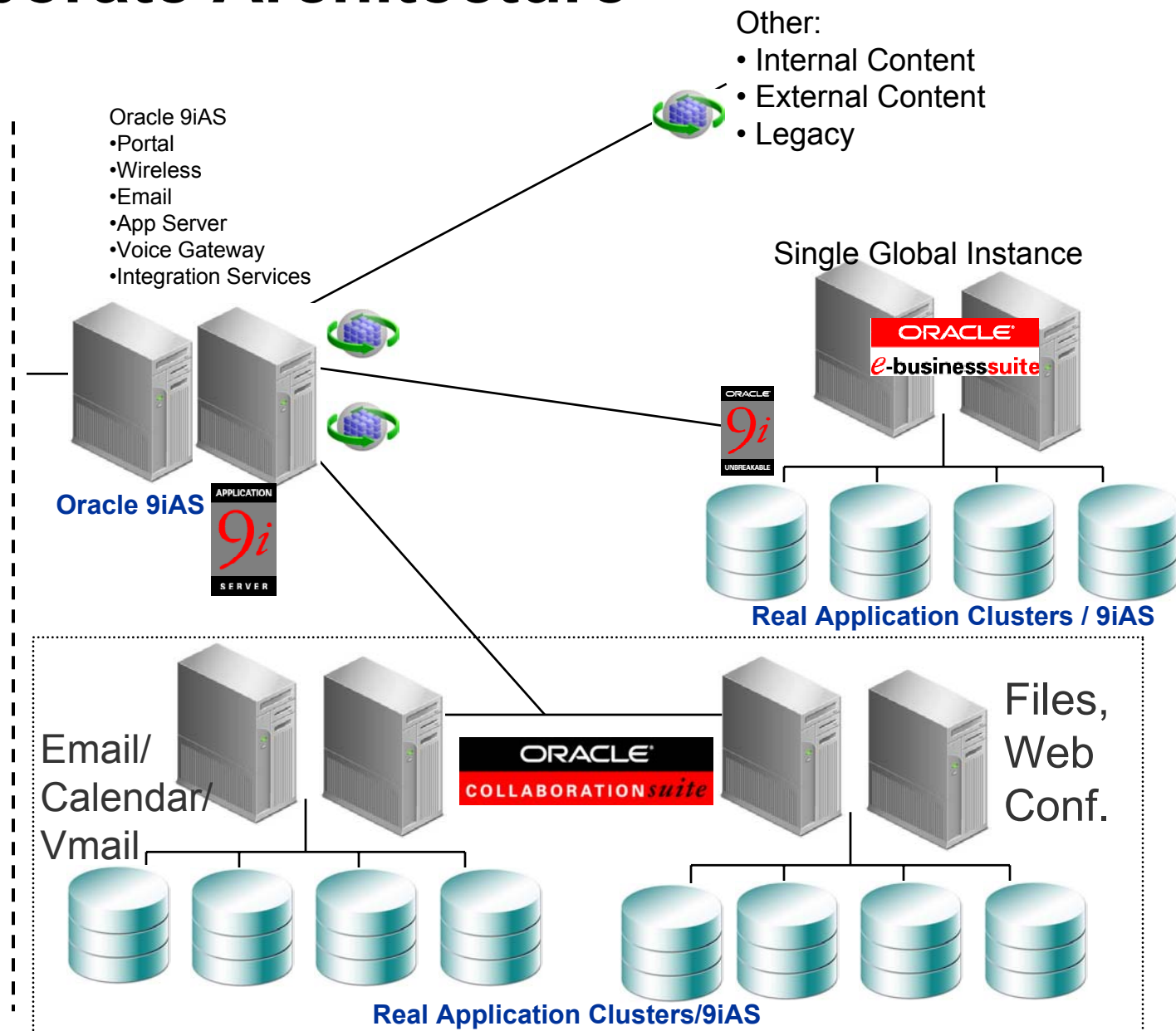| Application Types |
|---|
| **Business Systems** |
| • HR Systems 100 to 3ish (5) |
| • Accounting Systems 60 to 2 (5) |
| • Procurement systems multiple manual to automated (6) |
| **Administration Systems** |
| •Consolidating Data Centers 50 to 2 (1) |
| •Email Servers (1) |
| •97 to 2 w/fail over on HP Clusters and Oracle RAC |
| •Portals (via portlets) using Oracle Portal (2) |
| •My.oracle.com for 40,000 users |
| •File Servers (3) |
| •Thousands to 2 w/Oracle Internet File System (37k users) |
| •Voice Mail (10k users to date) |
| **Operational Systems** |
| • Sales Systems 100 to 1 (4) |
| • Customer support systems (9) |
| • Demonstration and Test systems (7) |
| • Knowledge management systems - by country to 1 (8) |

Oracle Corporate Architecture

Wireless

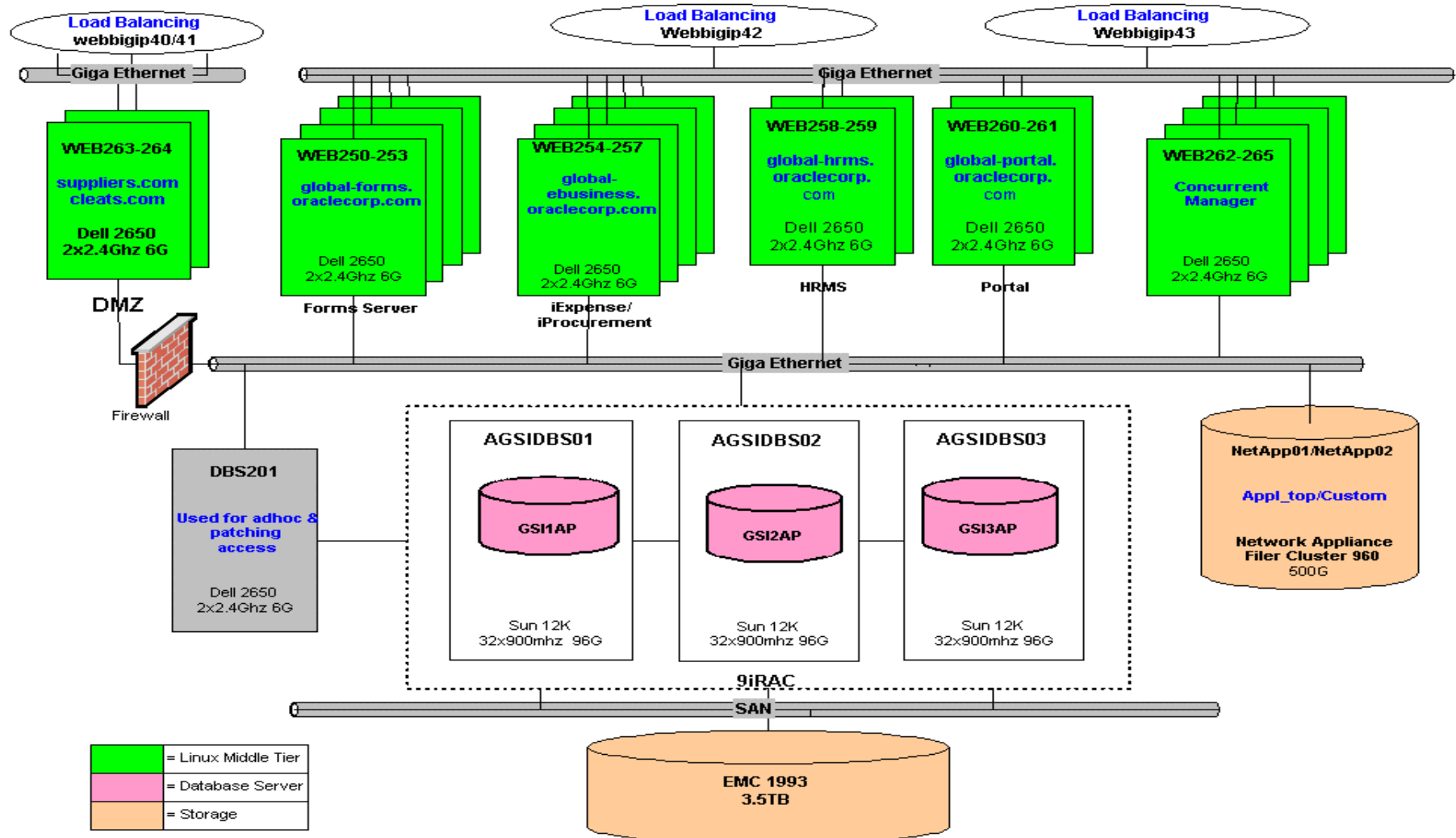Personalized Access (Role, Country)

Browser Single Sign on

Voice/IVR

Oracle 9iAS
- Portal
- Wireless
- Email
- App Server
- Voice Gateway
- Integration Services

Other:
- Internal Content
- External Content
- Legacy

Single Global Instance

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e-business**suite**

Oracle 9iAS

APPLICATION 9i SERVER

ORACLE 9i UNBREAKABLE

Real Application Clusters / 9iAS

Email/ Calendar/ Vmail

ORACLE COLLABORATIONsuite

Files, Web Conf.

Real Application Clusters/9iAS

Oracle's Production Implementation

GSI Production Hardware Architecture - Austin Data Center
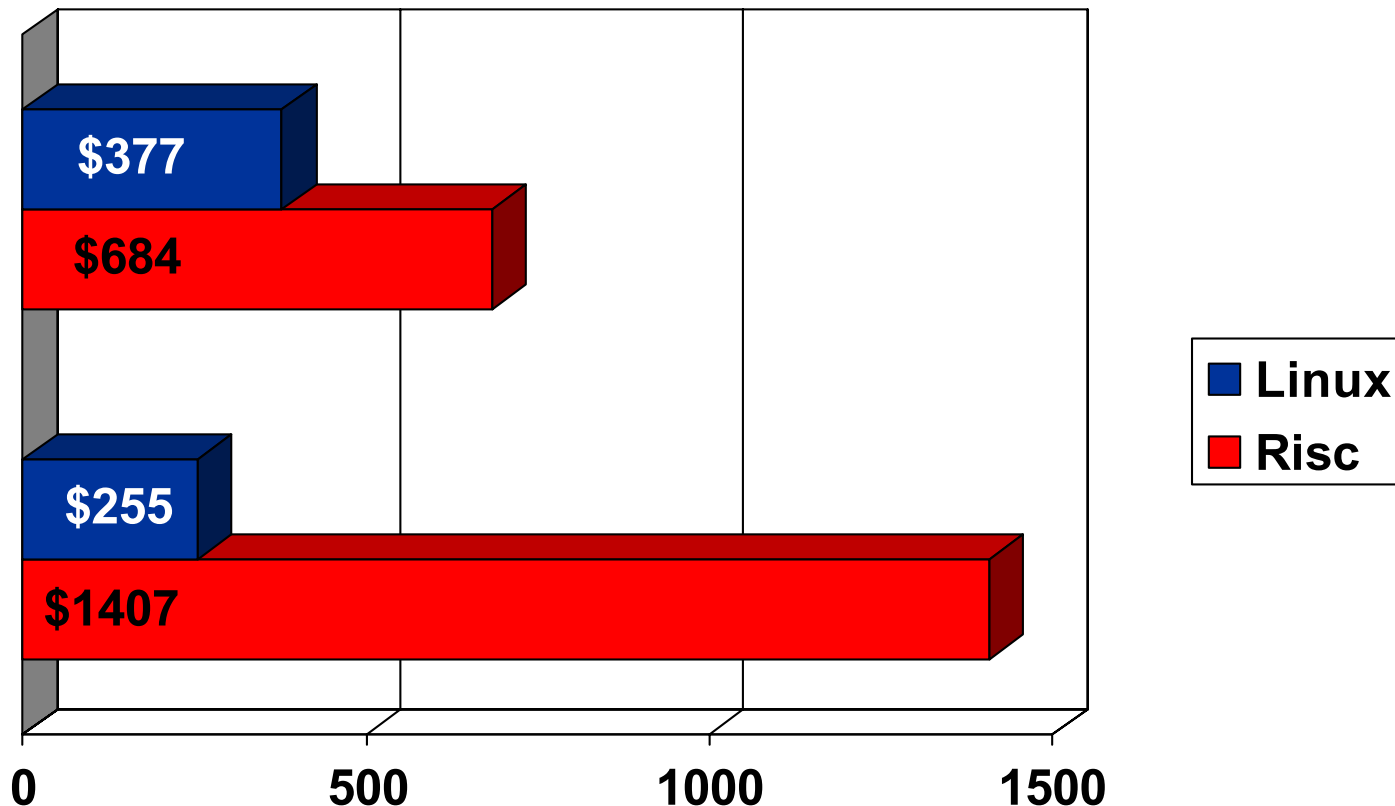
Building Blocks:

Commodity Hardware & Linux
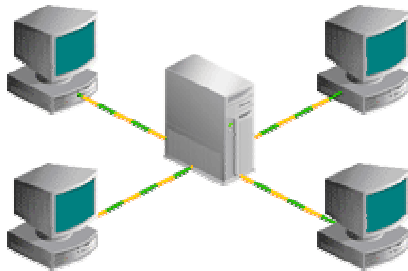
"We'll be running our whole business on Linux."

-Oracle Chairman and CEO

Larry Ellison

Linux Lowers Total Cost of Ownership

45%-80% lower TCO over RISC/UNIX

Source: IDC Research for Red Hat 2001   US dollars per user, per year, based on 1,000 users

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# Clustering Allows Packs of Small Machines to Act Like a Single Big Machine
Revolutionizes Enterprise Linux Economics

# of Nodes	Server Hardware	# CPUs	Price
2x	**IBM zSeries z900: 2064-116** (16 CPUs @ ~750MHz, 64GB)	32	$14.8M
8x	**IBM zSeries z800: 2066-004** (4 CPUs @ ~600MHz, 16Gb)	32	$3.6M
8x	**Dell PowerEdge 6650** (4 CPUs @ 1.6GHz, 16GB)	32	**$364K**

Low Cost Computing, Enterprise Class Reliability

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Building Blocks:

Outsourced Computing
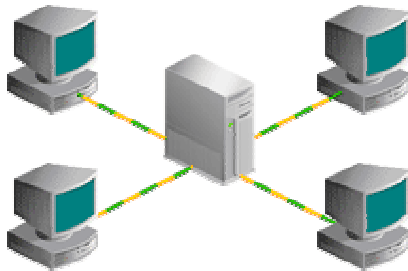
Cost of Managing Any Software

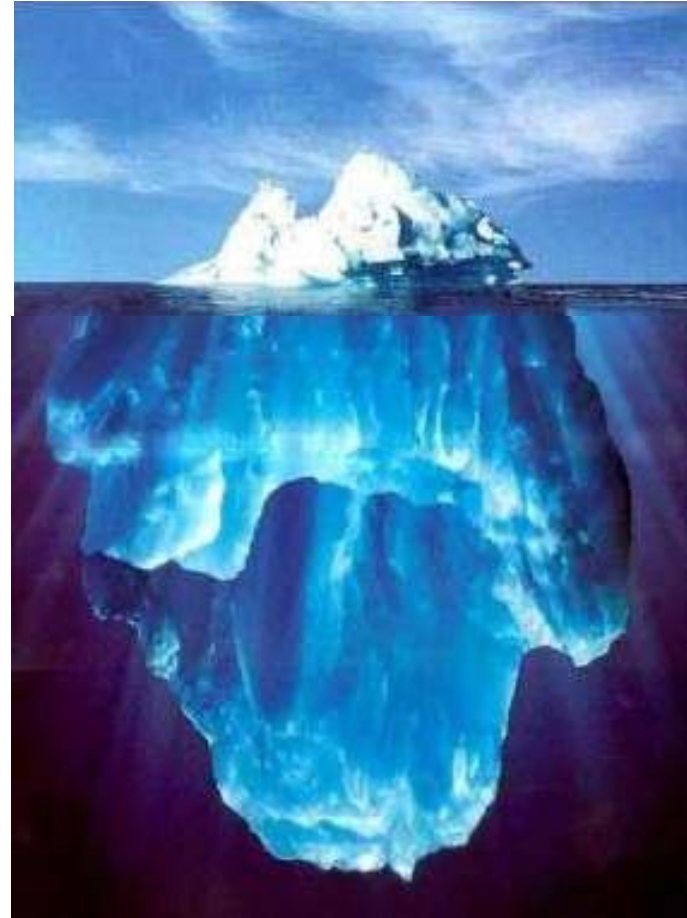*License Fees are only the Tip of the Iceberg…*

Application Suite Cost

$500k one time

Management Cost

4x Purchase Price
PER YEAR

$2M per year

$8M over 5 years

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Why, When I Can Do It Myself?

Value Proposition

- Focus on your Core Mission, not on Managing Software
    - Opportunity Costs are Tremendous
    - Budget Pressure for IT maintenance
- Better Service – Software Management
    - Public Sector, Educational, and Healthcare Institutions are spending 3-4 times the license costs supporting their software…often times, with little or no ROI or performance benefits.
- Better support, faster support resolution times, fewer product issues
- Low, Predictable, Monthly cost

Large Eastern State - Cost Savings

- Current Environment:
  - 59,000 Users; 91 Agencies
  - 278 Email Servers (that we know of)
  - Over 1000 file servers
- Migrate users to Outsourced Collaboration Suite
  - Email, File Sharing and Calendar only
  - Centralized in Austin Texas
  - Migration Cost included in the study
- Financed over five years to reduce initial cash outlay

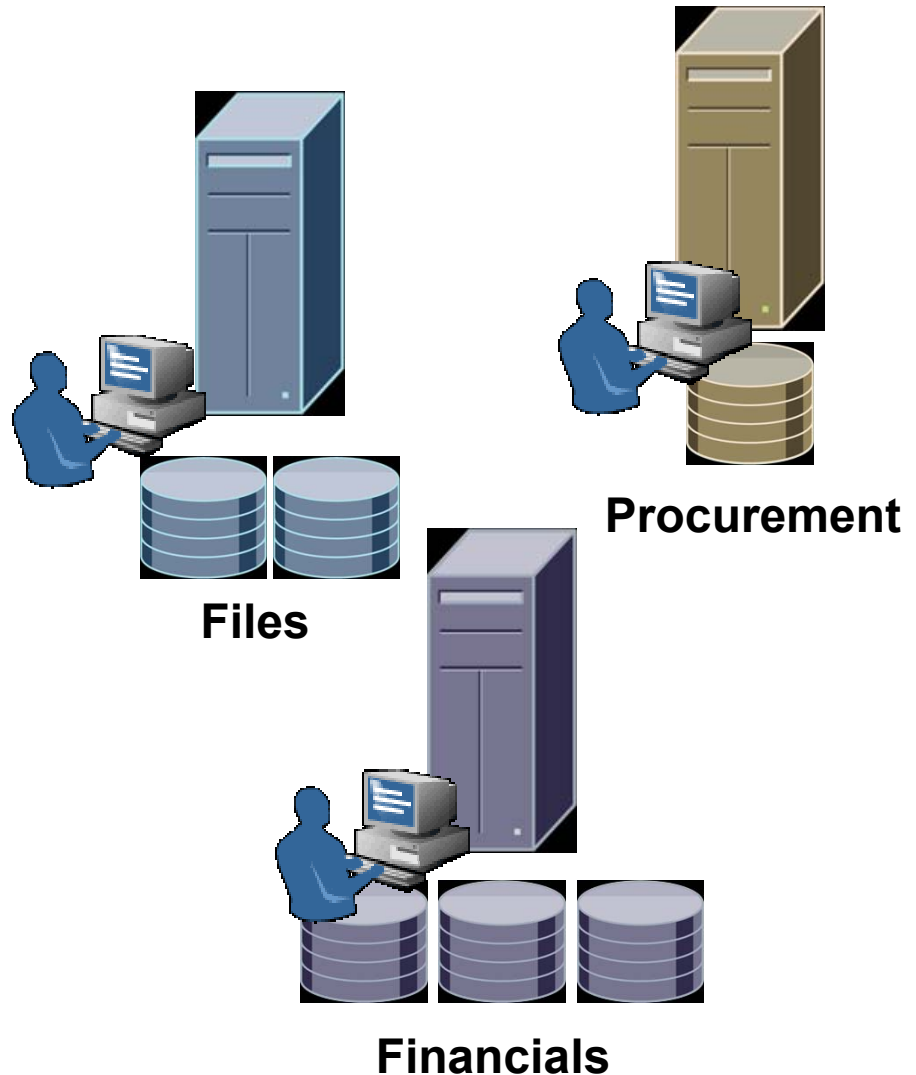| Year	Projected Savings
1	5 Million
2	12 Million
3	15 Million
4 thru 5	18 Million

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Building Blocks:

Grid Computing
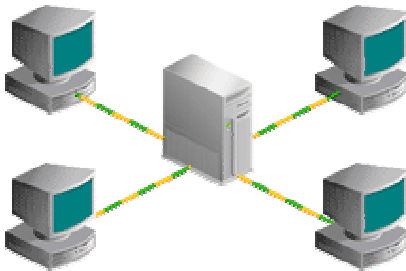
Problem: Islands of Computation

- **Limited scalability, no resource sharing**
- **Must be configured for peak loads**
- **Single point of failure**
- **Slow to adjust to business needs**

Files

Procurement

Financials

Grid Computing Eliminates Islands of Computation

Coordinated use of many small servers acting as one large computer.

IT Problem		Grid Solution
High h/w & s/w costs	➡	Low cost components
Separate servers	➡	Shared servers
Configured for peak	➡	Capacity on demand
Single point of failure	➡	Fault tolerant
Hard to change	➡	Flexible
Difficult to manage	➡	Unified management

Grid Computing

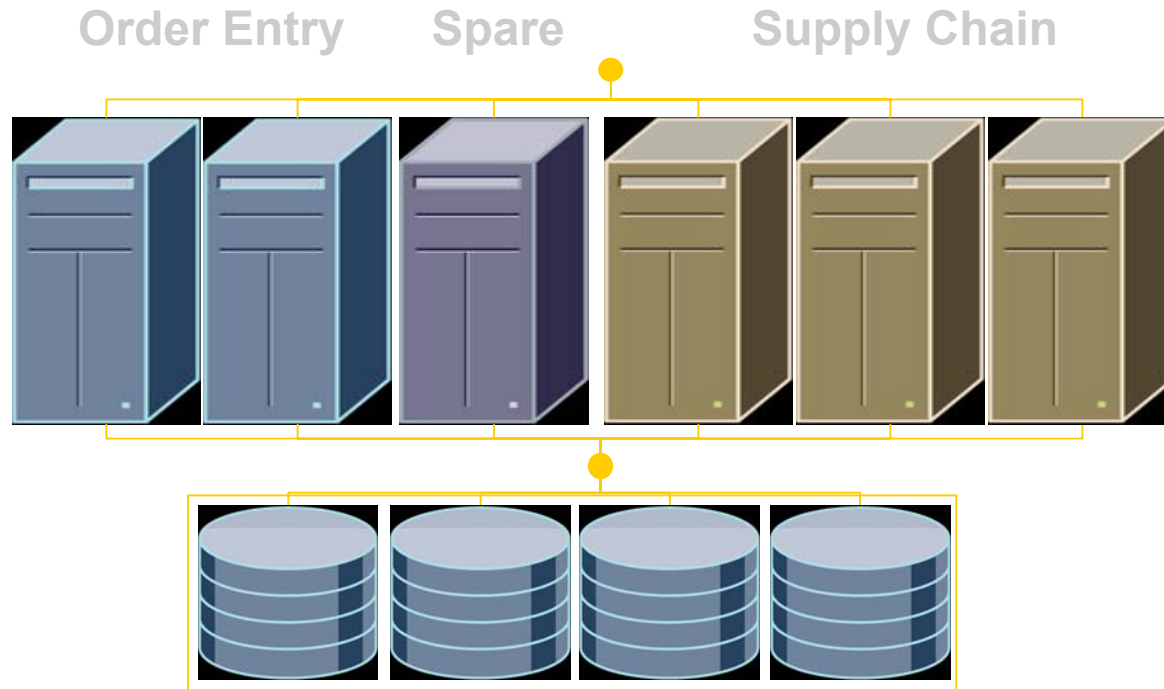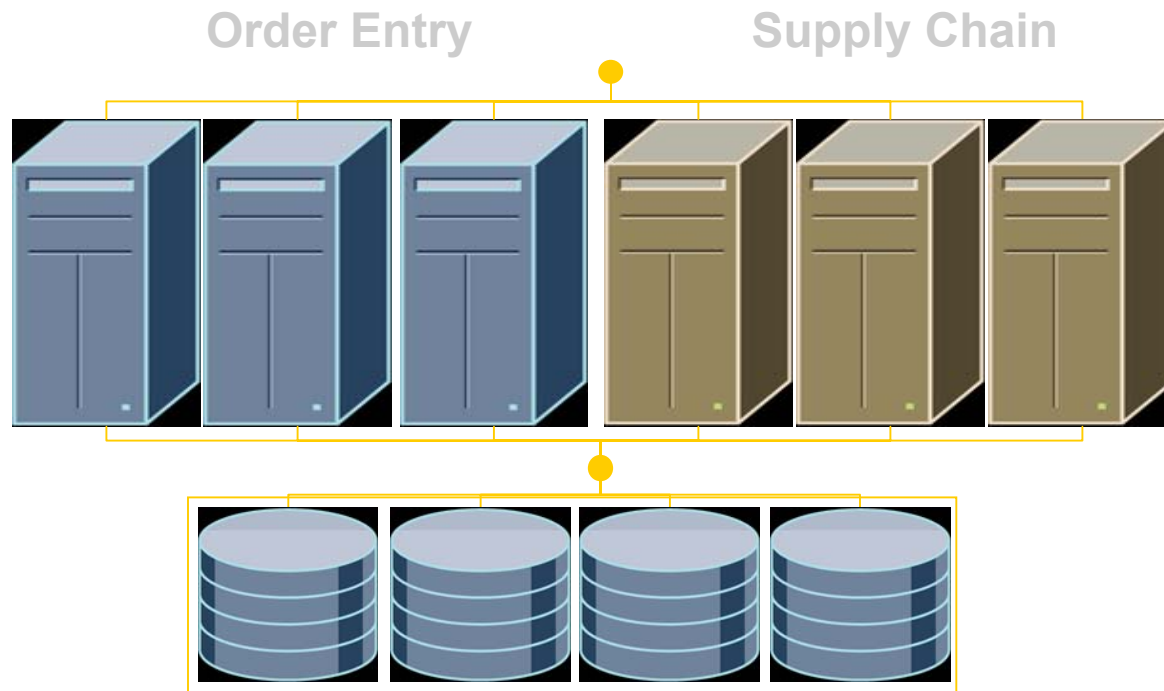| Storage Grid	Database Grid	Application Grid	Grid Control
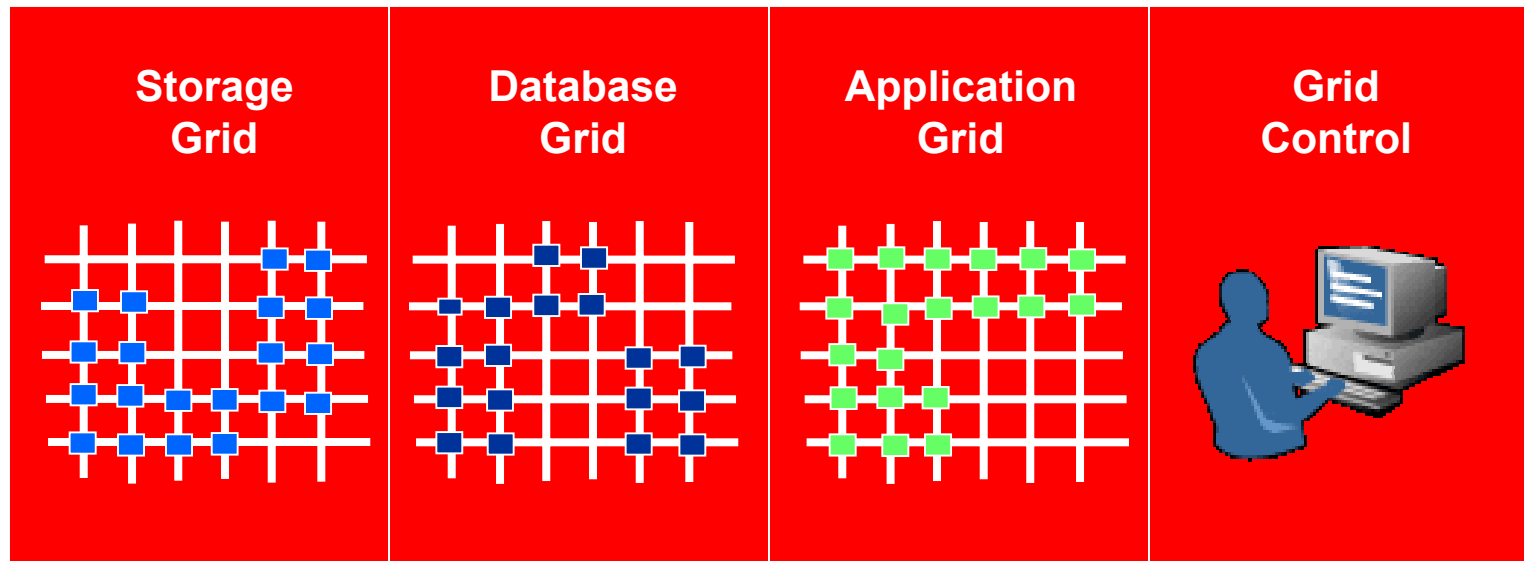
- **Half the Cost**
- **Highest Quality of Service**
- **Easiest to Manage**

Automatic Workload Management

Normal Server Allocation

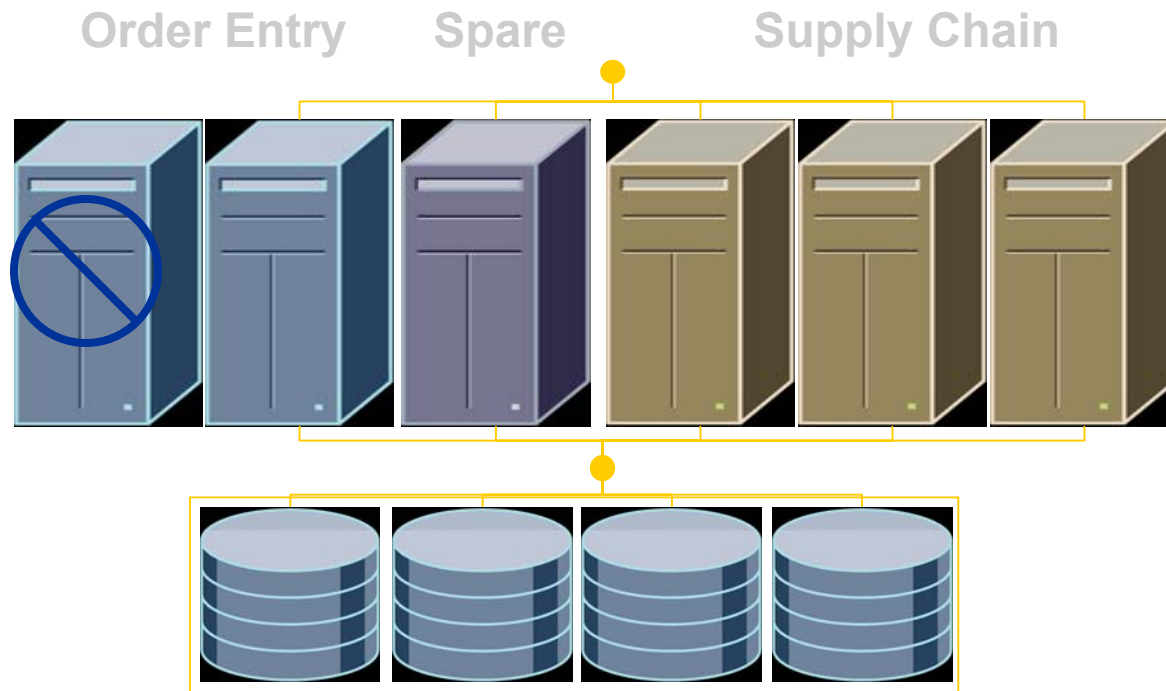# Automatic Workload Management

Order Entry   Supply Chain

End of Quarter

Automatic Workload Management

Order Entry   Spare   Supply Chain

Normal Server Allocation

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Automatic Workload Management

Server Fails

Automatic Workload Management

Order Entry   Supply Chain
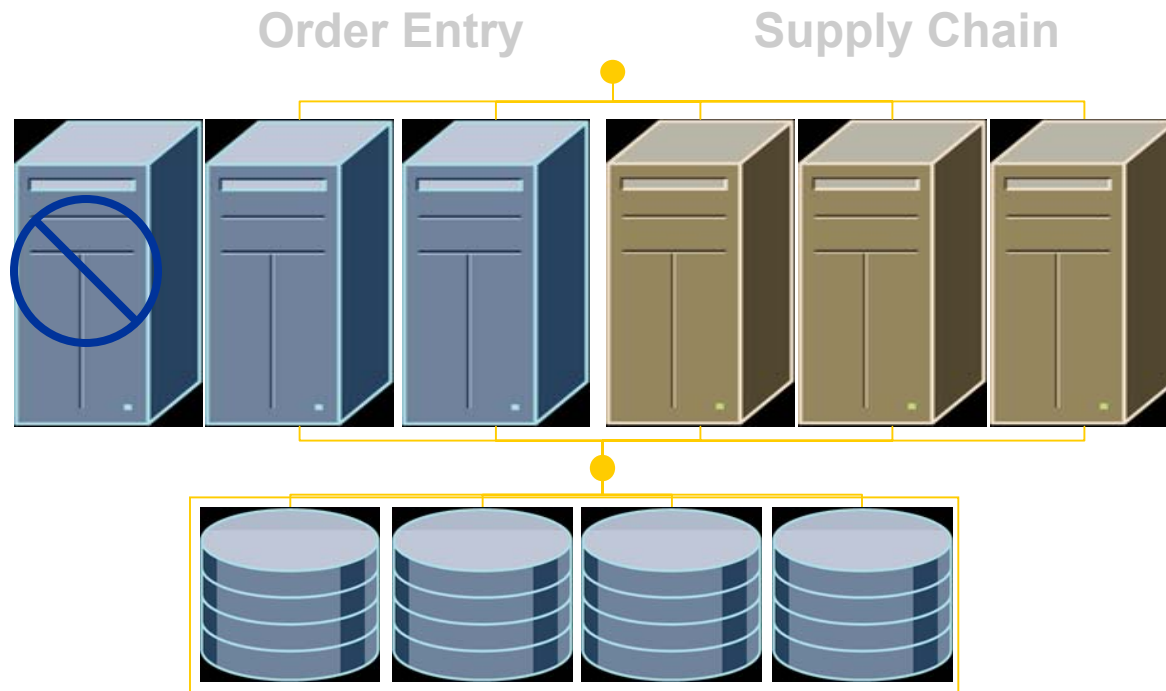
Reallocate Spare server to Order Entry

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Automatic Workload Management

Order Entry   Spare   Supply Chain
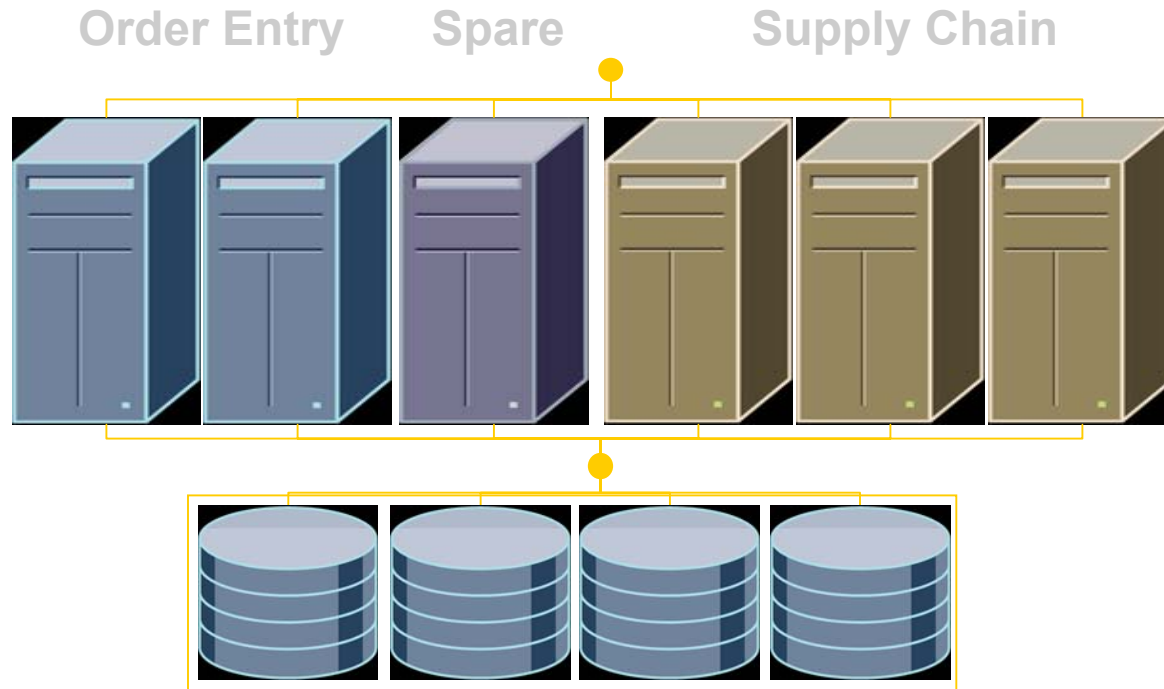
Failed Server Restored
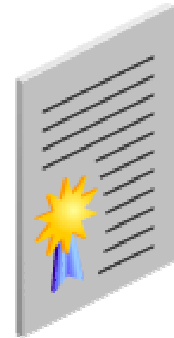
Putting It All Together

Case Study

Golden Gate University

(Campuses in California and Seattle)

GGU Legacy Environment

- Operating systems: Solaris, Windows, MPE/ix, Netware, Mac OS, Digital Unix

- Hardware platforms: SUN (Sparc), Dell (Intel), HP 3000, Macintosh, DEC Alpha

- Databases: Oracle, SQL Server, Access, FoxPro, HP Image

- Development: Coldfusion, HTML, Javascript, UniBasic

- No common code, data, OS, management process, customer experience

File / Print / Messaging

Web Architecture

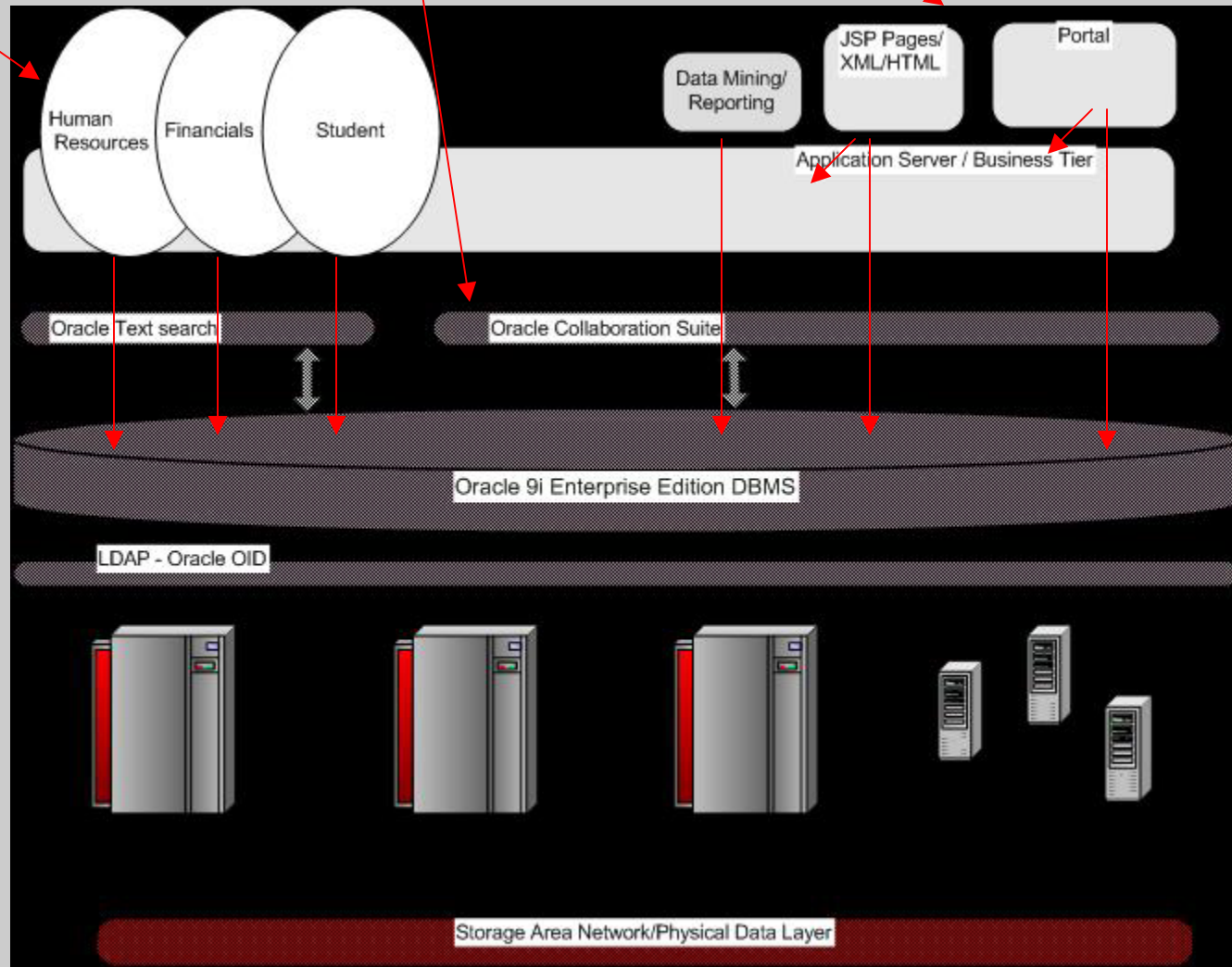Migrate legacy apps

Application Layer →

J2EE Application Server

Enterprise Database →

LDAP Directory Layer

Server Tier →

Linux

Storage Tier →

Human Resources

Financials

Student

Data Mining/ Reporting

JSP Pages/ XML/HTML

Portal

Application Server / Business Tier

Oracle Text search

Oracle Collaboration Suite

Oracle 9i Enterprise Edition DBMS

LDAP - Oracle OID

Storage Area Network/Physical Data Layer

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Outsourced enterprise model

Walnut Creek Sacramento Monterey San Jose Seattle Los Angelas

Remote User

Internet - VPN
GGU

GGU Services

Internet

Self Service Apps

Oracle
Outsourcing
Austin, TX

eCollege
Denver, CO

San Francisco

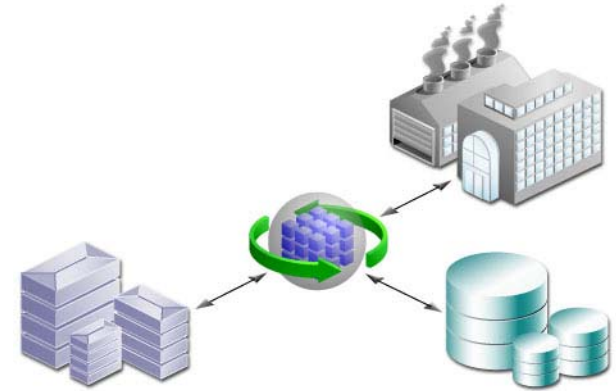Internet
(VPN)
Broadwing

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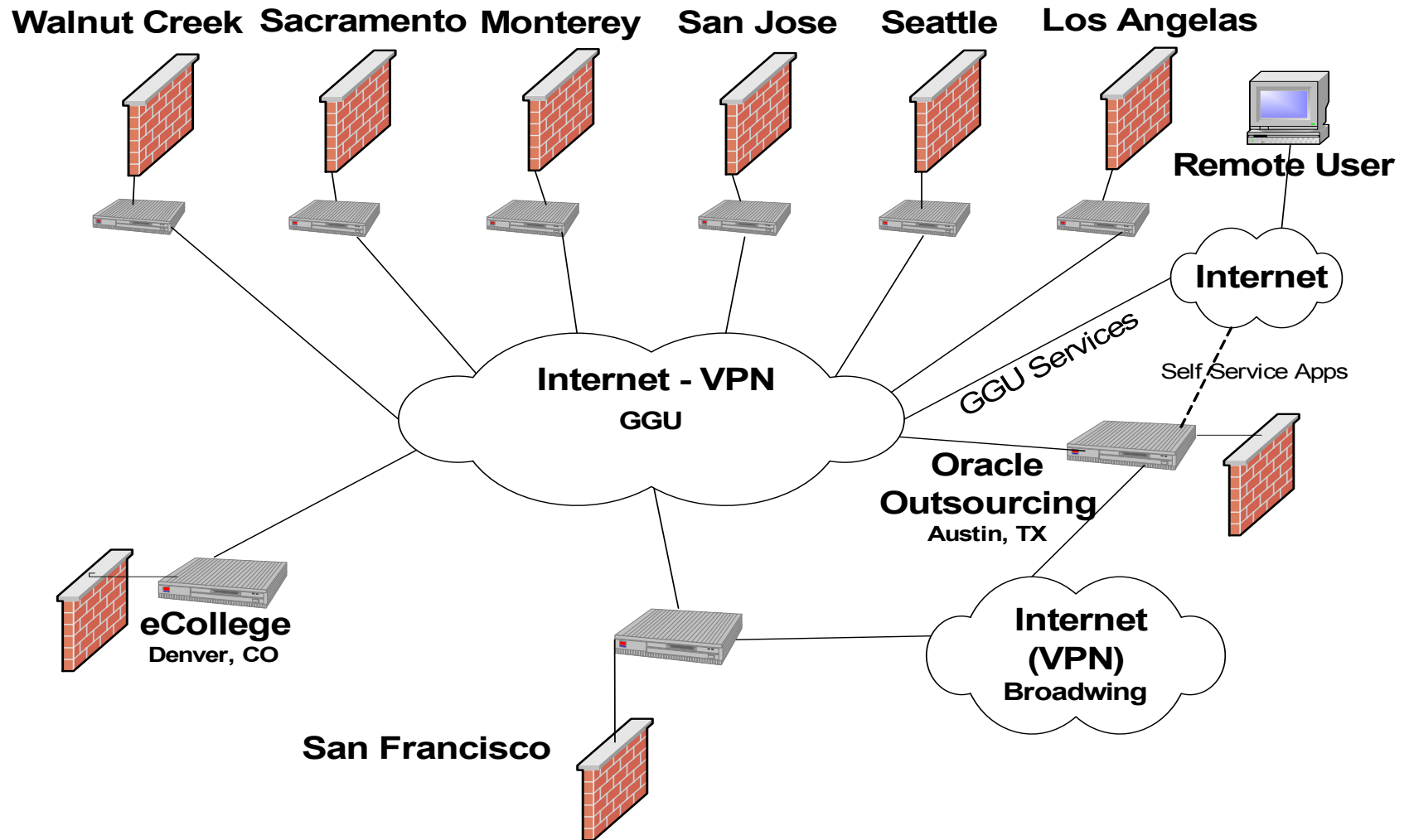
Summary: Industry Trends

- Consolidation Drives:
  - Cost reduction
  - Higher system availability
  - Stronger security
  - Better data
  - Greater Flexibility
- Leverages other industry trends
  - Low cost commodity hardware and OS's
  - Computing on demand (Grid Computing)
  - Outsourcing or Hosting
- Requires:
  - A target architecture
  - Standards based integration (process and data)
  - And most of all, Leadership